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Transforming the enterprise: The alignment of business and information technology strategies

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Abstract (Article Summary)

The effective and efficient utilization of information technology (IT) requires the alignment of IT strategies with business strategies. The strategic alignment framework discussed applies the strategic alignment model to reflect the view that business success depends on the harmony of business strategy, IT strategy, organizational infrastructure and processes, and IT infrastructure and processes. The aim is to build an organizational structure and set of business processes that reflect the interdependence of enterprise strategy and IT capabilities. Key steps in applying the strategic alignment framework include the following: 1. identifying the domain pivot and perspective and fitting the method to the perspective, 2. establishing the direction for using the framework, and 3. ensuring alignment of IT strategy with the enterprise.

Transforming the enterprise: The alignment of business and information technology strategies

by J. N. Luftman
P. R. Lewis
S. H. Oldach

The strategic use of information technology (I/T) is now and has been a fundamental issue for every business. In essence, I/T can alter the basic nature of an industry. The effective and efficient utilization of information technology requires the alignment of the I/T strategies with the business strategies, something that was not done successfully in the past with traditional approaches. New methods and approaches are now available. The strategic alignment framework applies the Strategic Alignment Model to reflect the view that business success depends on the linkage of business strategy, information technology strategy, organizational infrastructure and processes, and I/T infrastructure and processes. In this paper, we look at why it may not be sufficient to work on any one of these areas in isolation or to only harmonize business strategy and information technology. One reason is that, often, too much attention is placed on technology, rather than business, management, and organizational issues. The objective is to build an organizational structure and set of business processes that reflect the interdependence of enterprise strategy and information technology capabilities. The attention paid to the linkage of information technology to the enterprise can significantly affect the competitiveness and efficiency of the business. The essential issue is how information technology can enable the achievement of competitive and strategic advantage for the enterprise.

The world is experiencing profound changes. An inspection of recent political, environmental, and social events (e.g., restructuring of eastern Europe, global warming, AIDS) suggests that stability is rare and promises to become even scarcer in the future. The one thing that will not change is change itself. The impact and successive waves of influence (ripple effect) that these changes are making is substantial. Changes are drastically altering the way in which we conduct our daily activities and the way in which we prepare to meet the future. These changes to our world bring challenges and opportunities. Many of these changes demand dramatic business transformation. The objective of business transformation should be to control the challenges and take advantage of the opportunities.

Businesses everywhere are undergoing rapid and significant change. Some of the changes driving business transformations are introduced in the first section of this paper. The next section looks at how the strategic use of information technology is making a powerful impact on the enterprise as it transforms. Given this, the third section describes the significance of aligning business strategies and information technology strategies. The fourth section introduces methods used to create

information technology strategies and plans, and to re-engineer the business. The last section describes how to apply the strategic alignment framework to clearly identify an appropriate method to use to transform the enterprise. The objective of the frameworks and methods presented is to apply knowledge and technology to accelerate the transformation of companies into successful organizations that will be sustainable in the future. A critical question to ask while reading this paper is: Are you and your organization moving in a way that is appropriate and fast enough to keep pace with the changes driving business transformation?

Changes driving business transformations

The means for succeeding in an ever-increasingly competitive, global environment are constantly being explored by executives. Traditional barriers such as national boundaries, currencies, regulation, strong labor force, and economies of scale that once sheltered business are crumbling and are apt to be gone forever. The challenges and opportunities for companies are tremendous. Executives making critical business decisions by applying traditional ("old") methods will not obtain successful results. To compete in this new environment requires new methods. To compete in this environment demands the transformation of business. Numerous examples exist of traditional views of organization that are no longer adequate. The following six paragraphs are illustrative of changes that are driving the need to transform business. The significance of the business transformations are expanded and related to the alignment of business strategies and information technology strategies in the other papers in this issue of the *IBM Systems Journal*.

First, distinctions are breaking down between large and small businesses. Small, agile companies are now effectively competing with industry giants. Alliances between large and small companies are increasing. Strategic alliances and partnering support the business through these transformations via joint ventures, minority holdings, syndicates, knowledge exchanges, and the like. Such arrangements can make small companies look, feel, and act big, reaching for customers once beyond their grasp. These arrangements can also make large companies feel small and close, enabling them to target and service custom markets.

These *new* partnerships have increased, in part, to support companies as they move into global markets. The "triad" nations (consisting of the Americas centered on the United States, the European Community centered on Germany, and the Pacific rim centered on Japan, so identified as the most powerful based on their per capita gross national product) are forming the primary market for all major industries. Globalization of the enterprise reflects the view that most businesses will have to compete in a borderless environment. Rivalry among firms is accelerating as global boundaries are dissipating. There are continuous threats of new entrants and substitute products or services, and the bargaining power of suppliers and buyers is strengthening. Success in global markets demands more flexible and agile business structures. The changing nature of the global labor market presents an additional set of considerations. Global forces are changing competitors, labor, markets, suppliers, and regulations. For companies operating on a global scale, additional considerations are presented for achieving business and information technology alignment.

Third, the work force is shifting from blue collar and white collar workers to knowledge workers. Knowledge workers are the highly skilled customer-focused, self-directed, self-disciplined employees performing more complex, highly specialized responsibilities that capitalize on their intellectual abilities. These employees require increased learning support with the ability to share information, knowledge, and wisdom to leverage intellectual capital. This leverage includes creating and obtaining new knowledge, disseminating it, embodying it in new products and services, and fostering team learning and system thinking throughout the organization. Companies are paying employees for what they know instead of how much power they have or how many people they supervise. Companies are looking beyond their product lines to strategies built around core intellectual or service competencies. The capacity to manage human intellect and to transform intellectual capital into service offerings is becoming essential. Important questions to consider include: How do we continuously make our organization smarter? What are we trying to learn? What do we need to know? And, how can we leverage our intellectual capital? Information technology should be applied to enable employees to realize their full potential.

Leadership roles and skills are altering the traditional role of a manager from one who controls to a coach who inspires, guides, and develops employees by setting goals, priorities, and standards. This change goes beyond the traditional paradox of McGregor's idea[1] that managers regard people as either X, needing control, or Y, being motivated. A leader encourages others to take responsibility for their thoughts and actions by guiding, not controlling. A way of differentiating a leader from a manager is to think of a leader as conveying "what" and "why" versus "how" or conveying "context" versus "content." Abandoning Taylorized (Frederick Taylor,[2] who thought control to be the exclusive domain of managers) methods of reducing the control that skilled workers have over their jobs is most important. You are only a leader if you have followers. New organizational structures are replacing functional hierarchies and matrix structures with flexible, empowered, inspired, integrated business teams that have fewer levels of management and function more like communities. In essence, companies are replacing vertical hierarchies with horizontal networks. These organizations call for more horizontal communications (cross-functional business activities) and cooperation among teams. Valuing the talents and contributions of diverse employees is significant in helping individuals to do the best they can as they perform in these teams. "Rightsizing" of organizations decreases or eliminates nonessential staffs and operations while maintaining employee morale. The issue of executive leadership is central to the effective management of technology.

Fifth, the goal of serving the widest range of customer needs in the most cost-effective and responsive way represents a shift to new competitive strategies. One new strategy transforms our Industrial Age legacy of mass production to the new imperative of mass customization. Mass customization of product and service offerings supports the ability to rapidly design, produce, price, and deliver tailored products and services to meet dynamic customer demand at minimum expense. This result implies the requirement to continually improve offerings to meet customer expectations. Companies engaged in mass customization are flexible and responsive. They use *evolutionary* process change to attain *revolutionary* change in products and services. They deliver a dynamic flow of products and services from a stable base of processes. The competitive and environmental context that provides the enterprise with an opportunity to identify how information technology can be used to achieve flexible efficiency and move beyond the capabilities of the mass-production firm is significant. The continual improvement of business processes enhances the way in which the enterprise functions to deliver value, increase customer satisfaction, improve quality, reduce cycle time, and improve employee morale. The continual improvement of the quality of delivered products and services is assessed, and actions are taken to ensure that the enterprise has met standards of excellence as the customer would define them. The need to delight customers is critical to the survival of the business.

Last, the rate at which new technology is introduced is increasing 20 to 30 percent annually,[3] impacting the demand to apply state-of-the-art technology strategically and to accelerate innovation. The technology pace will continue to increase and be magnified by new network communications opportunities. Approaches for evaluating the value of investments using traditional financial measures (especially such techniques that rely on a forecast of costs, revenues, or benefits in a quickly changing economy, as net present value, return on investment, and break-even analysis) are no longer in tune with the internal and external conditions of today's business environment. These measures were more appropriate when customers were less demanding and product changes were infrequent. Today customer satisfaction, quality, flexibility, cycle time reduction, and employee morale must also be considered. Managers need reliable relevant information that can be used to analyze alternatives, project potential outcomes, and prioritize opportunities for improvement. The ability of information technology to provide the capability to enhance product variety (e.g., mass customization of products and services), reduce the time-to-market (e.g., timeliness, faster product delivery), reduce error rates (e.g., use of bar codes in retailing), and support increased transaction volumes (e.g., New York Stock Exchange) are examples of business value that must be considered. Strategic advantage using information technology cannot be realized unless the organization goes beyond concerns of return on investment in technology to considering the value of information itself as an economic asset. Achieving competitive and strategic advantage by leveraging information and knowledge assets is critical.

Figure 1 Representative examples of contemporary, competitive applications of information technology

Distribution	• Notebook/palm-top computer-based processing enhances just-in-time (JIT) product delivery and market analysis
Education	• Computer-assisted instruction for individual education and training • Multimedia sessions for whole group learning • Worldwide network linking students, leading educators, and researchers
Financial services	• Automated teller machines support 24-hour banking services • Automated teller machines offer nonfinancial services (e.g., travel reservations) • Cash management systems provide comprehensive views of a client's financial position • Electronic funds transfer is eliminating the need for traditional checks • Imaging systems automate handwriting recognition and reduce paper usage • Knowledge-based systems speed credit authorization or claims adjudication reviews
Manufacturing and engineering	• Specialized applications such as computer-aided design and manufacturing (CAD/CAM), computer-aided engineering (CAE), computer-integrated manufacturing (CIM), and materials requirements planning (MRP) • Generic technologies such as robotics, virtual reality, and holographic imaging - improve product delivery, shorten product life cycles, extend partnerships by providing vendors access to these systems, enhance intrafirm communications, and improve product flexibility
Retail	• Point-of-sale terminals provide faster customer checkout, measure customer preferences, and automate just-in-time inventory control
Travel	• Reservation systems provide current information to agents and travelers; they also assist in analyzing demand and altering prices

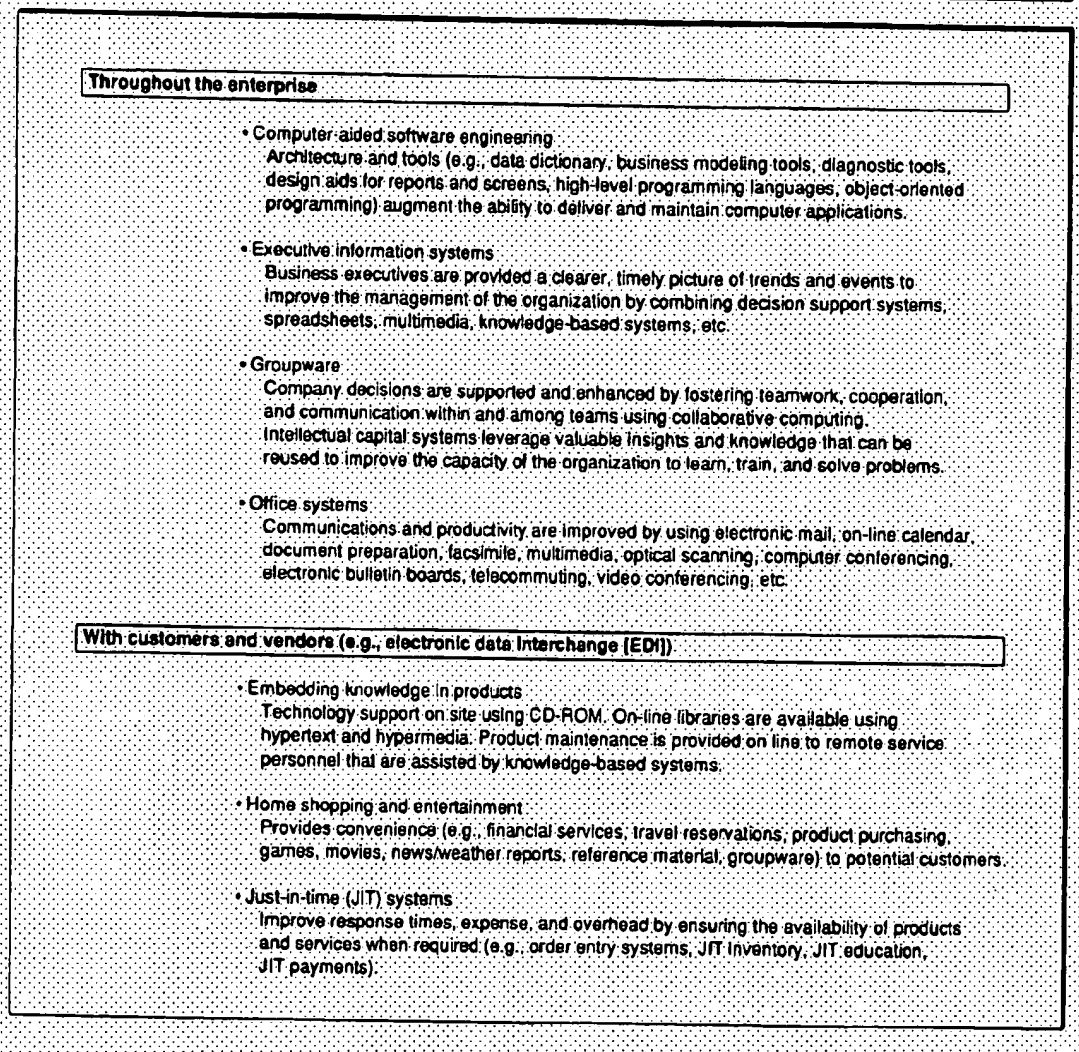
The role of information technology in transforming the enterprise

Given the preceding discussion of changes that are driving the need to transform the business, this section describes how the strategic application of information technology can enable the enterprise as it is transformed. We begin by providing a definition of information technology.

Information technology has become the generally accepted term that encompasses the rapidly expanding range of equipment (computers, data storage devices, network and communications devices), applications (see Figure 1 and Figure 2 for contemporary examples), and services (e.g., end-user computing, help desk, application development) used by organizations to deliver data, information, and knowledge. Information technology (I/T) provides strategic value to all parts of the business. Support of the administrative infrastructure (responsibilities and authority structure of the enterprise), key business processes (how important business functions operate or flow), and operational skills (day-to-day support of staff) represent three significant areas. I/T is used to reduce costs, enhance product and service quality, improve customer service, integrate supplier and customer operations, and enable organizational learning. Information technology is also used to create new marketing opportunities.

The strategic use of information technology makes a powerful impact on a business as it is transformed, as illustrated in Figure 1 and Figure 2. Davis and Davidson[4] emphasize that companies capturing and applying information at each point of contact with customers will be better off

Figure 2 Representative examples of contemporary intra/interorganizational information and knowledge sharing



than those that do so only at one or a few points. As an example, think about the value of information that you provide the next time you pay for your weekly groceries. Valuable information (e.g., products purchased, frequency of purchases, use of "store cards" that allow purchases to be related to a personal profile [family size, income, profession, etc.]) is captured and applied by the local retailer, store headquarters, and product manufacturers and distributors in areas such as planning marketing activities and inventories. Davis and Davidson further suggest that, by the year 2020, 80 percent of business profits and market values will come from the part of the enterprise that is built around the business of information. The potential for I/T to transform business processes radically has captivated the interest of many executives. Lester Thurow, dean of the Alfred P. Sloan School of Management of the Massachusetts Institute of Technology, sug-

gests that companies have to be able to apply and integrate information technologies (e.g., computer-aided design and computer-aided manufacturing, CAD/CAM) into the entire product process (including design, marketing, and service).[5] Peter Keen points out in his paper in this issue[6] that once information technology is applied to change the rules of competition in an industry, at least 50 percent of the companies in the industry will disappear within a decade. He suggests that their failure is the result of not recognizing the advantage of using information technology early enough to act appropriately. In essence they did not see the emerging alignment between their business priorities and their information technology capabilities.

As implied in Figure 1 and Figure 2, the innovative application of information technology provides immediate advantage over competitors. Lasting advantage is derived from using I/T to support what an organization does well and to add value to organizational resources that are not readily available to competitors. However, with information flowing freely and quickly among nations, people everywhere are exposed to new products when they become available anywhere.

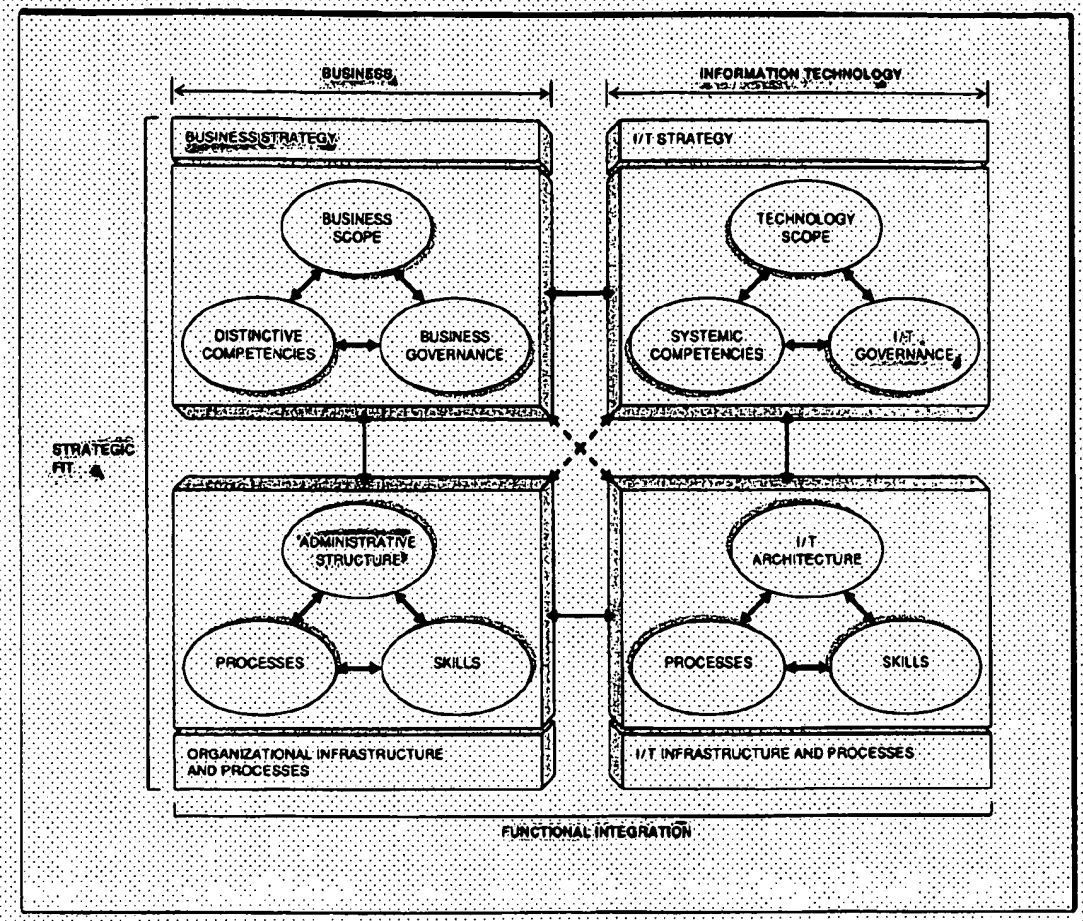
Competitors will become aware and carry out similar, potentially improved, strategies. Organizations will have to continuously respond to maintain an advantage. Hence, the journey is a continuous one. The point is that no industry, organization, or function is immune from the opportunity to obtain advantage from I/T. Management must recognize that effective and efficient strategic leadership can be derived and executed only through the partnership of the business units and the I/T units of the company. The business functions (e.g., marketing, manufacturing, finance, human resources) traditionally enjoy well-established relationships with executives and users. The information technology function is establishing similar relationships. The alignment or fit of information technology with the business is fundamental to the notion of transformation. The appropriate utilization of information technology throughout the organization should be established as an explicit requirement for acceptable performance. The objective of information technology is not merely to solve the operating problems of a particular department. An organization should focus on how I/T can strengthen the competitive performance of the enterprise. Organizations should be thinking about competing power, not computing power.

The alignment of business and I/T strategies

The strategic use of information technology is a fundamental issue for every business. In essence, I/T can alter the basic nature of an industry. The effective and efficient utilization of information technology requires the alignment of I/T strategies with business strategies. IBM has sponsored significant research in pioneering this insight, which grew out of work started in the mid-1980s by John Henderson, now of Boston University, and N. Venkatraman of the Massachusetts Institute of Technology. IBM has used the results of this research as the building block for the methods applied in its consulting group. Their paper in this issue[7] is an extension of their earlier research.[8] The results are also incorporated in the executive education programs that are offered in IBM's Advanced Business Institute in Palisades, New York. The strategic alignment framework (Figure 3) applies the Strategic Alignment Model to reflect the view that business success depends on the harmony of business strategy, information technology strategy, organizational infrastructure and processes, and I/T infrastructure and processes. It may not be sufficient to work on any one of these areas in isolation or to only link business strategy and information technology. Often, too much attention is placed on technology, rather than business, management, and organizational issues. The objective is to build an organizational structure and set of business processes that reflect the interdependence of enterprise strategy and information technology capabilities. The attention paid to the harmony of information technology and the enterprise can significantly affect the competitiveness and efficiency of the business. The essential issue is how information technology can enable the achievement of competitive and strategic advantage for the enterprise.

Information technology (I/T) has transformed the basic nature of many industries. Information technology is enabling business processes to be redesigned in ways that heretofore were thought impractical or impossible. We see the effects almost daily. Representative examples of the competitive application of I/T are listed in Figure 1. Figure 2 illustrates examples of sharing information and knowledge within and between organizations that are dramatically altering the methods and speed of communications. Ensuring that the enterprise is effectively and efficiently using its

Figure 3 Strategic alignment framework



information technology resources is essential for success. For companies to succeed in an increasingly competitive, information-intense, dynamic environment, the alignment of business strategies and information technology strategies is a necessity. The purpose of the remainder of this paper is to describe the Strategic Alignment Model, provide an overview of the methods used for I/T strategy, I/T planning, and business transformation, and relate how to use the Strategic Alignment Model to scope and apply the methods.

The strategic alignment framework (pictured in Figure 3) illustrates the range of choices that could be addressed during the management process for designing I/T strategies, I/T plans, and business transformation. A definition of the four domains, or boxes, their contents, and the relationship of strategic fit and functional integration is included in the description of strategic alignment terminology in the Appendix of this paper. In essence, business and information technology strategies are in alignment when business objec-

tives are enabled, supported, and stimulated by information technology strategies.

The need to link business strategies with I/T strategies consistently ranks among the top two objectives of senior executives within the information technology function (as reported from IBM's Advanced Business Institute customer executive surveys). Based on the business strategy, how can information technology optimally deploy technology to transform the business? The methods described in this paper convey the potential for information technology to create competitive and strategic advantage. Creating strategic advantage and competitive advantage are not new concepts. The use of information technology to create these advantages quickly is new.

Using information technology for strategic advantage implies the application of information technology to enable strategies that enhance the critical success factors or core competencies, or both, of the business. Here, information technology can be used to support the business in achieving its objectives (e.g., systems and technical infrastructure or architecture are in place to support the business by providing the opportunity to compete, improve productivity and quality, and enable new ways of managing and organizing). Strategic advantage is represented by the ability of the information technology function to affect the choices that determine the infrastructure and processes of the organization to run the business better. Using I/T to enhance the vertical relationship illustrated in Figure 3 as strategic fit provides the opportunity for strategic advantage.

Information technology can also deliver competitive advantage by being a proactive contributor to mission-critical systems. Here, information technology can be used to create new marketing opportunities. The competitive potential perspective, described later in this paper, illustrates the application of information technology for competitive advantage. Functional integration, illustrated by the horizontal relationship in Figure 3, gives I/T the opportunity to provide competitive advantage.

In both cases (competitive advantage and strategic advantage), it is imperative that the company is at least as fast as its competitors in applying information technology. Strategic advantage and competitive advantage can quickly become strategic necessity and competitive necessity when the enterprise lags behind its competitors. They then become the defensive measures that must be taken to survive. This defensive use suggests that the development of I/T strategy and planning does not occur after the business strategy is produced. It illustrates the first element of time: the need to ensure that the enterprise does not fall behind its competitors in the use of I/T. For example, airlines that were not able to quickly respond to the early use of on-line reservation systems found themselves losing significant business. As a result, several filed for bankruptcy. The second element of time occurs when the enterprise is the first to gain an advantage from applying information technology. This advantage is typically temporary, lasting only for the time it takes for competitors to replicate the application. It is a mistake to contend that I/T on its own can provide long-term advantage. For example, banks that were early implementers of ATMs (automatic teller machines) found that their advantage was short-lived.

Both elements of time suggest that deriving strategies is an iterative process that fosters opportunities for applying emerging technologies to directly influence the direction of the enterprise. New technologies will continue to offer new opportunities for competitive advantage and strategic advantage. The intensely competitive marketplace is driving innovation and is constantly demanding new I/T services. Strategic alignment is not an event, but a continuous journey of transformation. Naturally, applying I/T to old, ineffective, inefficient business processes will not create business value. It is not the information technology itself that will create value, but the business processes that exploit the technology. If this is the case, the analysis of processes for opportunities should precede carrying out I/T strategy and planning methods. Just as important is the need to analyze strategies for I/T opportunities, before re-engineering business processes.

Strategic alignment provides a logical framework for analyzing strategic choices in enough detail to ensure successful implementation of business, technology, and infrastructure direction. Strategic alignment provides a vehicle for strategic thinking. It is a technique for continuously thinking about how to analyze and derive organiza-

tional direction. The model has been applied to companies of all types and sizes that are developing information technology strategies and plans or transforming their business, or doing both. Strategic alignment reflects the view that business success depends on the harmony of business strategy, information technology strategy, organizational infrastructure and processes, and I/T infrastructure and processes. The focus on linkage is important to ensure that priorities are consistent, that resources are appropriately allocated, and that the sophistication of technologies matches the sophistication of the organization. The attention paid to the harmony of information technology and the enterprise can significantly affect the competitiveness and efficiency of the business. It is important to keep the intrinsic, dynamic nature of the methods in mind as they are adapted to fit the organizational demands. The essential issue is how to use I/T to enhance the competitiveness, effectiveness, and efficiency of the business.

Strategic planning is often considered a panacea or an academic exercise. Frequently information technology strategies and plans are prepared using traditional views such as:

- Basing I/T strategies and plans purely on technology
- Changing I/T infrastructure and processes without linkage to the enterprise
- Creating business strategies and plans without I/T participation
- Developing strategies and plans using a rigid, inflexible set of methods and metrics
- Improving old processes by simply applying technology
- Not creating I/T strategies at all
- Transforming organizational infrastructure and processes without I/T involvement

These views are no longer acceptable in practice. The fact that these views are not uncommon suggests a need to clarify the meaning, value, and approach to strategic planning. The classical view of strategic planning flows from the vision and mission of a company. The vision is a brief inspirational statement expressing the chief executive's futuristic picture of the enterprise. The mission presents a broad description of the purpose of the organization. The strategies describe the way in which the business allocates resources and takes action to achieve the vision and mission. They are a pattern of policies and plans of action that develops competitive advantage over a given period. Following the creation of strategies, objectives (general statement about the organizational direction) and goals (specific targets with timeframes) are defined. Strategic planning sets the direction for an enterprise so that it overcomes potential threats that stand in its way while it takes advantage of opportunities that present themselves. It plans the essentials for the effective and efficient conduct of the enterprise. The strategy provides a lasting set of values for customers that far surpasses those of competitors. The methods used to create the strategic plan must include elements that are meaningful, understandable, and executable as they are communicated and carried out. Using strategic alignment as an all-embracing framework for strategic planning is described in the last section of this paper.

Although the enterprise typically has a clear business strategy, it often lacks a coherent information technology strategy or direction for infrastructure and processes. More often, if business, I/T, and infrastructure and processes strategies exist, they fail to relate to one another. Recognition of the strategic role that information technology can have is driving the need to ensure its linkage to the business. Meeting this objective requires a shift of interest when deriving I/T strategies and plans from technological considerations to examining organizational transformation to obtain competitive and strategic advantage. The extent to which information technology is embedded in business processes, products, and the myriad of information service requirements and opportunities that exist today demands alignment of business and I/T strategies. Business objectives must be well-supported and stimulated by information technology strategies and capabilities. This statement is especially true when considering the environmental forces that make strategizing difficult and critical to the enterprise (e.g., quality, globalization, and moving from mass-production markets to mass-customization markets).

The following illustrates three areas, addressed by the methods described in the next section, that can impact the ability of an organization to carry out strategic I/T initiatives. First, applying information technology to old, ineffective, inefficient business processes ignores organizational infrastructure deficiencies. If this is the case, the analysis of processes for opportunities should pre-

cede the use of I/T strategy and planning methods. Second, there are still many examples of organizations that do not make strategic use of information technology. From the perspective of the business units of the organization, many companies have difficulty identifying strategic opportunities. It is not always clear how to appropriately apply new technologies. Often the people with business knowledge do not understand how information technology initiatives can provide strategic advantage or competitive advantage. Just as often, people with information technology knowledge are not familiar with the business. The ability of I/T to deliver strategic function is typically inhibited by budget constraints, a dynamic user environment, difficulty obtaining an executive sponsor or commitment, and not balancing requirements with the I/T skill base. How well the information technology function understands business priorities, minimal end-user involvement in the infrastructure and processes of I/T, and the overall resistance to change also impedes innovation. There may also be times when the information technology function does not have knowledge regarding technology trends and directions. Third, there are examples of companies that have attempted to carry out strategic initiatives but delivered systems that did not run in the way in which they were intended. Too often, end-user participation throughout the delivery process is inadequate to ensure project success. Having clearly defined and agreed upon deliverables at the earliest point in time is most important.

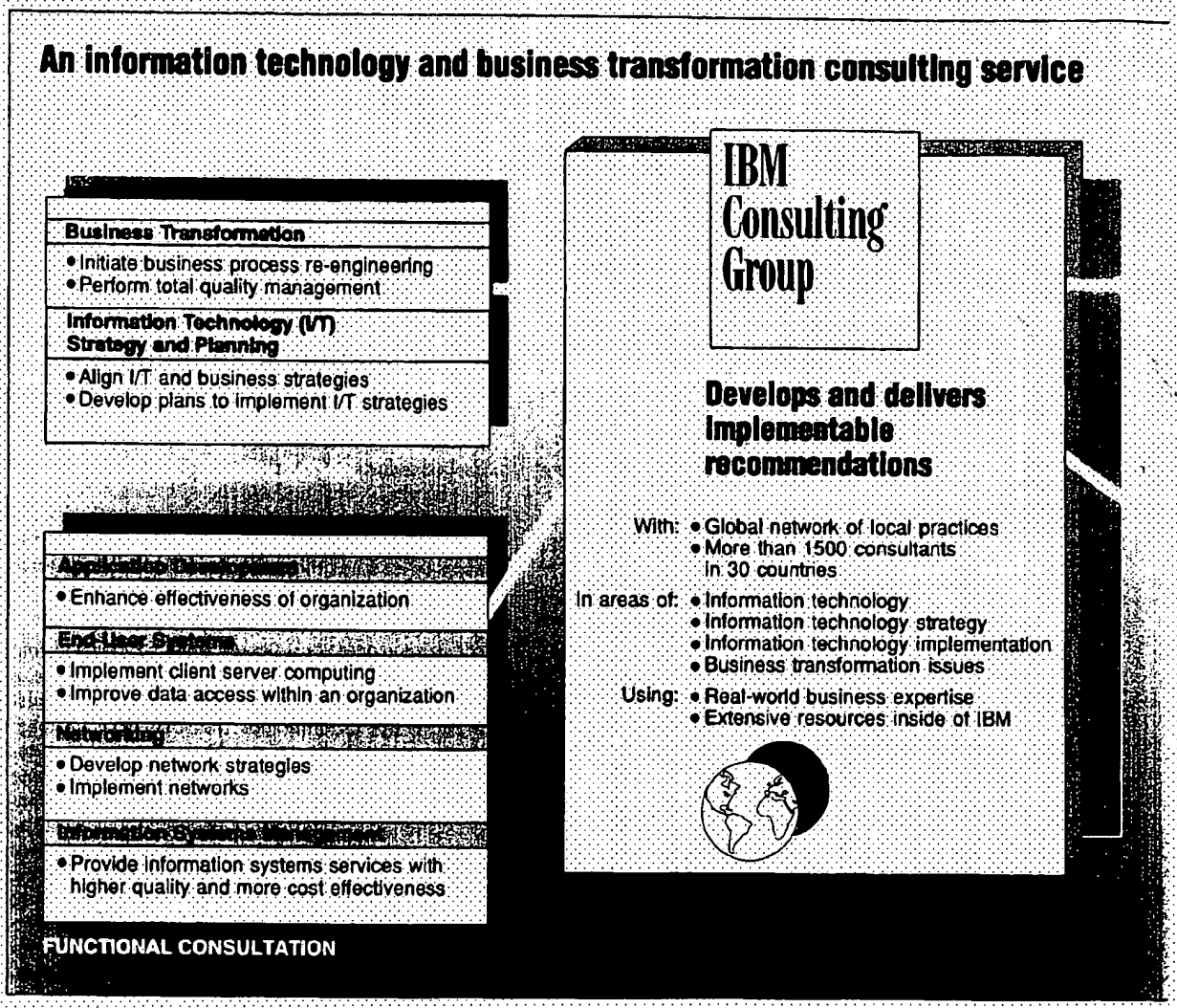
Whether the company has applied information technology to transform the enterprise, is experiencing difficulties in making strategic use of I/T, or is somewhere between the two, the description of the methods for transformation that follows should prove valuable. Strategic alignment provides a vehicle for strategic thinking. It is a technique for continuously thinking about how to analyze and derive organizational direction. Strategic alignment is not just a single event but a continuous journey of transformation.

Methods for transformation

Thus far the discussion in this paper has indicated that the effective and efficient utilization of information technology requires the alignment of I/T strategies, business strategies, and infrastructure and processes. In 1992, IBM formed the IBM Consulting Group to help bring its expertise and experience to clients trying to transform their business. The Consulting Group facilitates the building of intellectual capital through partnerships with researchers from major academic institutions, through use of IBM scholars, and through the work done with clients. From these resources we have developed unique ideas and approaches to solve client issues, and have applied these techniques by means of our methodologies to a number of engagements with clients worldwide. IBM's consulting practices have used strategic alignment as a building block for creating the methods used in conducting client engagements. Specific analytics have been incorporated from previous IBM offerings or created to achieve alignment for the client's business. The new methods have been built combining the best of earlier techniques with new approaches. The result has been attained via the symbiosis of recent consulting experiences with changes in the industry. The following subsections provide an overview of several methods available to transform the business.

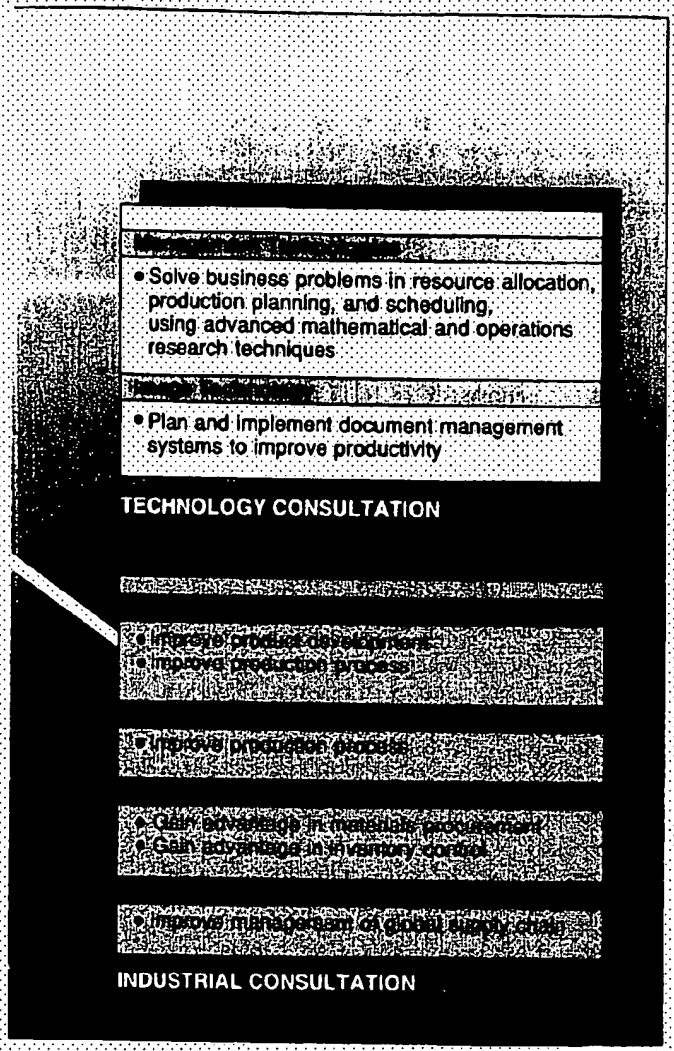
I/T strategy and planning methods. I/T strategy and planning are pivotal for an enterprise. These methods link the strategic directions of the business to the technologies that can best leverage those strategic directions. Business unit and operation strategies drive decisions that determine where and how the enterprise will compete. Understanding an enterprise's approach to generating value can be translated to appropriate application of information technology. These decisions drive the information technology strategy and planning to support the business. Information technology strategy and planning produce opportunities for the future use of technology in the enterprise. Companies, before using these methods, should have developed a vision of where their business is headed. Companies should also have developed a set of key business strategies that will position their products and services in the markets in which they choose to compete. Last, companies should have determined the organizational structure and business processes that must be addressed to execute the business strategies effectively.

With use of the business strategies, organizational structure, and understanding of key processes, the creation of an I/T strategy will develop a set of information technology initiatives that will



provide the enterprise with a technological advantage in competing effectively and efficiently. The creation of an I/T plan will define the actions necessary to bring the information technology strategy to reality. It uses the aligned business and I/T strategies to produce valued projects that encompass a full range of implementation activities. The methods focus on clearly defining what the organization can do to obtain competitive advantage, strategic advantage, business performance improvement, and growth opportunities.

Business transformation methods. Business transformation provides a detailed approach to transforming an enterprise through total quality management and business process re-engineering for companies of all types and sizes. Application of the methods will result in a comprehensive course of action that defines what the organization can do to enable the business to achieve and sustain measurable benefits. Although most corporations are developing strategies to respond to intensified competition, they are also under growing pres-



sure to improve business performance. Their response in most cases involves some combination of automation and streamlining. Unfortunately, these traditional approaches are not resulting in the continual improvements and breakthroughs that companies need to succeed, let alone survive.

By integrating several known analysis methods and examining the interrelationships of the business strategy, I/T investments, and business organization, maximum benefit can be derived and sustained from re-engineering efforts. (Note: Many people suggest that you cannot "re"-engineer a process that has not been previously engineered. For simplicity, we have used the term re-engineering to refer to both.) Significant value is achieved by applying quality principles to areas of planned change and considering the perceived value from the perspective of the customer. The fundamental focus should be on delighting the customer. Business transformation uses I/T strategy and planning methods to provide any required study of the company's I/T investments.

"Improving" old processes by simply applying information technology ignores organizational infrastructure and processes and performance deficiencies. Administrative structure, processes, and skills that were created in a very different competitive environment should be evaluated for opportunities of redefinition before technology is applied. Such action implies going beyond merely enhancing existing processes. The emphasis is on transformation.

The competitive environment will continue to change dramatically. Companies must emphasize quality, customer satisfaction, speed, and cost avoidance to survive. To forge ahead and manage change, companies have no choice but to transform their business. Business process re-engineering and total quality management (TQM) provide methods to meet the challenges.

Functional methods. The creation of systems architectures and deriving and implementing information technology plans for application development, end-user workstations, networking, and information systems management follow the development of an I/T strategy or an I/T plan. These methods ensure that detailed technical considerations are integrated into a comprehensive, cohesive design that will deliver the aligned I/T strategy. The objective of these methods is to address the question, "How to do it?"

For example, rapid prototyping techniques improve business processes by capturing the business vision and quickly demonstrating the value of the application to the organization. Many of these prototypes evolve to executable business applications. The basic premise is to exploit the current I/T infrastructure by unlocking the electronic data that exist today on disparate systems

and databases, and presenting the data as information required to make critical business decisions. A second example is the assessment of I/T processes such as the management of problems, changes, capacity, performance, availability, operations, and help desk. Recommendations and plans are documented to the I/T organization, structure, processes, politics, standards, and technology to realize improvements in the effectiveness, efficiency, and adaptability of resources. Naturally, the harmony of the previously described management methods is essential.

The role of information technology in transforming the enterprise is dependent on its perceived importance to the business as viewed by top management. The importance of I/T is reflected in the way in which it participates in the strategy formulation process. The information technology function should become more influential during the creation of business strategies. The trend is to integrate I/T into the formal strategy framework. Adhering to strategic alignment allows both I/T and business-oriented managers to communicate with and become partners with each other. It ensures that new technologies will result in new commercial opportunities, leading to business growth, profits, and competitive and strategic advantage. Historically, the information technology function has been considered a support function. This function must be repositioned to where it can play a critical role in strategy formulation and execution. The enterprise should recognize and exploit information technology capabilities to positively impact business scope, governance, organization, and competitive forces. Strategic alignment provides a vehicle to reposition the information technology function by ensuring the alignment of I/T with the enterprise.[9]

Application of the strategic alignment framework to identify a method of transformation

No single approach exists to create an I/T strategy or an I/T plan, or to identify opportunities for business transformation. Establishing the linkage between business strategies, I/T strategies, and infrastructure and processes should be included as a major part of any method used. The framework presented is the application of the Strategic Alignment Model described by Henderson and Venkatraman.[7] The focus of the methods must be specified by the specific business and information technology issues faced by the enterprise. Moreover, the focus must continue to emphasize the value of information technology activities. This focus includes how to create it, how to preserve it, and how to measure it. Examples of important questions addressed in using the framework for I/T strategy, I/T planning, and business transformation include:

- What is the content of a strategic planning process?
- What choices are currently focused on?
- What choices should be focused on?
- In what sequence should the choices be analyzed and addressed?

Three conclusions can be realized from addressing these questions. First, it is important to recognize that the selection of an approach to derive strategy and plans often imposes different perspectives. The executive team must ensure that it has chosen the right approach. Second, the strategic management process should be viewed as dynamic and continuous. The complexity implied by the strategic alignment framework suggests a need to focus on a subset of choices, that is, a strategic perspective for a planning process. Such a focus carries an inherent risk, however, which can be resolved by viewing the strategic management process as a series of events that, taken together, lead to an alignment strategy process. It must be a strategy that is meaningful, understandable, and executable. Third, executives should regularly revise their planning process. Too often the planning process reflects what an enterprise has done rather than what it should do. Shifting perspective requires implementing new approaches, developing new concepts, and even defining new languages. In essence, it is this very shift in perspective that is central to alignment. The planning processes must continuously adapt to ensure that over time an effective alignment of I/T strategy, business strategy, and infrastructure and processes is achieved.

From looking at the strategic alignment framework in different ways, we can determine what method is most appropriate to help transform the enterprise. There are three major steps involved in applying the strategic alignment framework for scoping and using the methods described in the previous section. These steps are described in the following subsections. In summary, the steps are:

1. Identifying the initial domain pivot and perspective
2. Fitting the method (e.g., I/T strategy, I/T planning, business transformation) to the perspective
3. Establishing an approach for incorporating the results into the unanalyzed domain or box

Identifying the initial domain pivot and perspective, and fitting the method. There are four strategic perspectives: the competitive potential perspective, the technology potential perspective, the service level perspective, and the strategy execution perspective. The objective is to select one of the perspectives as a vehicle for identifying an approach for applying the frameworks for I/T strategy, I/T planning, or business transformation, or for a combination of these methods. Each perspective reflects an interplay among three important domains (see Figure 4) forming what would appear as a triangle. Note that by creating perspectives that reflect cross-dimensional alignment (described in the Appendix) one is, at a minimum, always considering a relationship that involves both strategic fit and functional integration. The reader is asked to keep in mind the three steps introduced in the previous paragraph while reading the rest of this paper. Step 3 will determine, based on the established direction described in the later section on establishing direction, how to continue the process.

The essence of strategic alignment depends on the application of potential triangles (as described in the Appendix and illustrated in Figure 4) consisting of a domain anchor, domain pivot, and impacted domain.

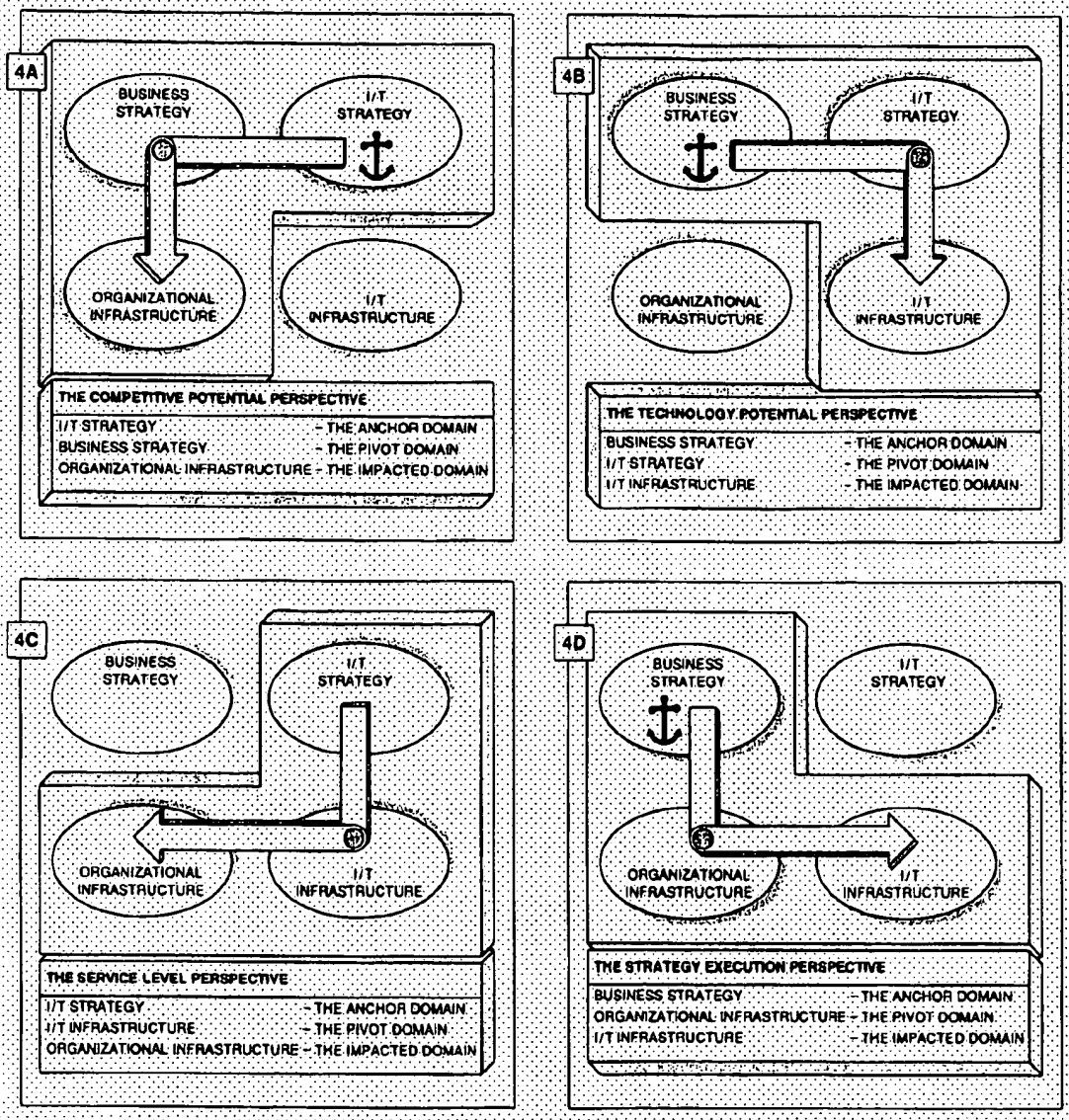
Competitive potential. The competitive potential view, considered the I/T strategy view, reflects how emerging technology could influence or enable new business strategies (e.g., new market opportunities), thus creating competitive advantage. This perspective, pictured in Figure 4A, relates the interaction between I/T strategy (domain anchor), business strategy (domain pivot), and organizational infrastructure and processes (impacted domain). The triangle is illustrated in Figure 5 as the I/T strategy (ITS) triangle. It is a management process that explicitly considers how information technology may be applied to enhance the business strategy and that ultimately results in the transformation of the organizational infrastructure (re-engineering). The approach focuses on ways to singly or in combination enhance awareness, discover opportunities, and position the firm to use information technology creatively. It emphasizes a two-way link in that I/T strategy can affect business strategy. In this perspective, the role of senior management is that of a business visionary. The executive actively considers how to leverage technology to achieve major change (which may lead to business transformation).

Two well-documented examples of companies that have exploited the use of information technology for competitive advantage are American Hospital Supply (Automated System for Analytical Purchasing, or ASAP, an electronic order entry, order tracking, and supplies management system),[9] and American Airlines, Inc. (SABRE** computerized reservation system).[10] This framework is based on Porter's notion of competitive strategy and value-chain analysis.[11] It is critical to ensure that senior executives are aware of the potential of information technology, that their visioning processes are awakened to new business or service opportunities, and that they can assess the strategic importance that information technology can have on their strategies. The use of technology scan techniques (identifying or forecasting, and mapping future technologies) plays a major role.

I/T strategy methods are effective for competitive potential. There is a tight linkage to business transformation (e.g., some of the techniques will be interwoven into the I/T strategy effort, and business transformation will follow the I/T strategy) that is illustrated later in Figure 7. This is necessary to bring process issues into accord with changes in technology. Rapid prototyping provides techniques to visualize how the technology will work in the business environment.

Technology potential. In the technology potential perspective, the focus is on establishing strategic fit for information technology. This perspective is where I/T is used to enable new business strategies. Specifically, executives need to understand the relationship, pictured in Figure 4B, between business strategy (domain anchor), I/T strategy (domain pivot), and I/T infrastructure and processes (impacted domain), and become technology visionaries. This concept is illustrated in the I/T strategy (ITS) triangle of Figure 6. Executives must understand both the technology marketplace and the strengths and weaknesses of their

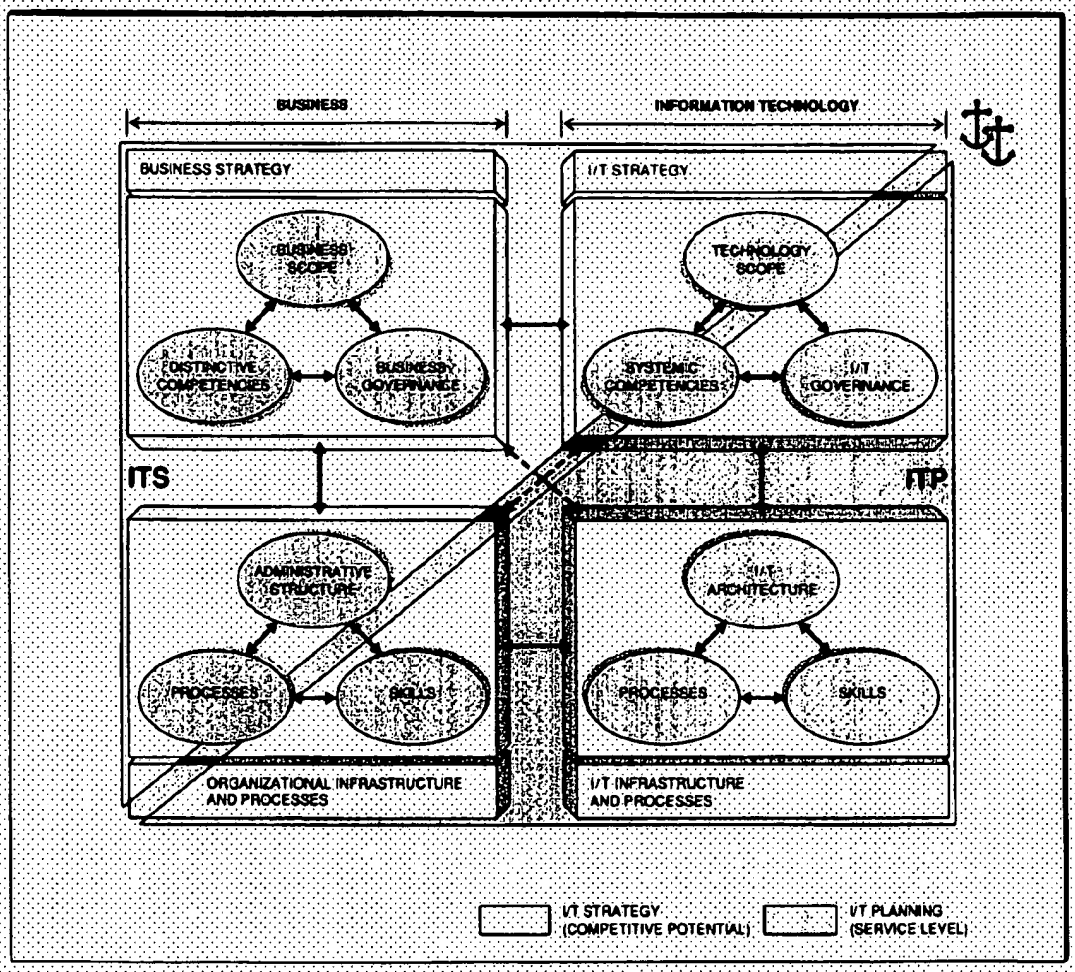
Figure 4 Strategic perspectives



own internal I/T infrastructures. At issue is the need to manage technical risk effectively. The executive not only has to choose an effective position in the technology market, but must ensure that the embedded technology, systems, and people can be changed in ways to support these technology choices.

This method is a "top down" approach. It tends to evaluate strategies and plans under different

Figure 5 Competitive potential and service level perspectives

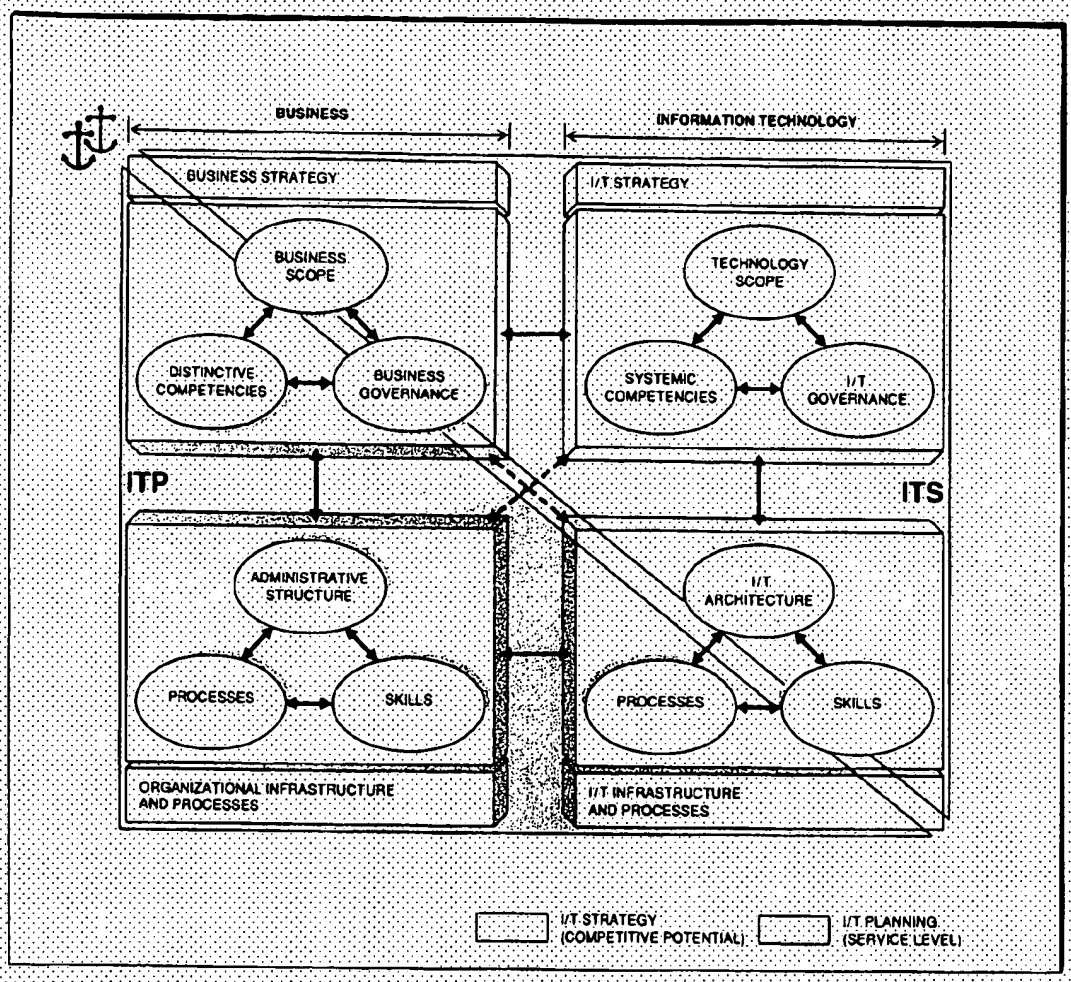


conditions. Effective sources of techniques include McFarlan who suggests a portfolio approach,[12] or others (e.g., Nolan[13]) who suggest an evaluation of the I/T stages of growth, and plan accordingly. Two well-documented examples of companies that leveraged technology to meet the business strategy are Otis Elevator, Inc. (elevator service and maintenance)[14] and Frito-Lay, Inc. (product marketing and delivery).[15]

I/T strategy methods are effective for technology potential (illustrated in Figure 6). There is a tight linkage to business transformation and I/T planning (some of the techniques will be interwoven into the I/T strategy effort, and either I/T planning and business transformation, or one or the other, will follow the I/T strategy, as illustrated in Figures 6 and 7, respectively). Rapid prototyping techniques are also effective here.

Service level. Suppose the enterprise was actually committed to a tightly integrated information technology environment. What if this technology failed? In this perspective, the strategic issue is

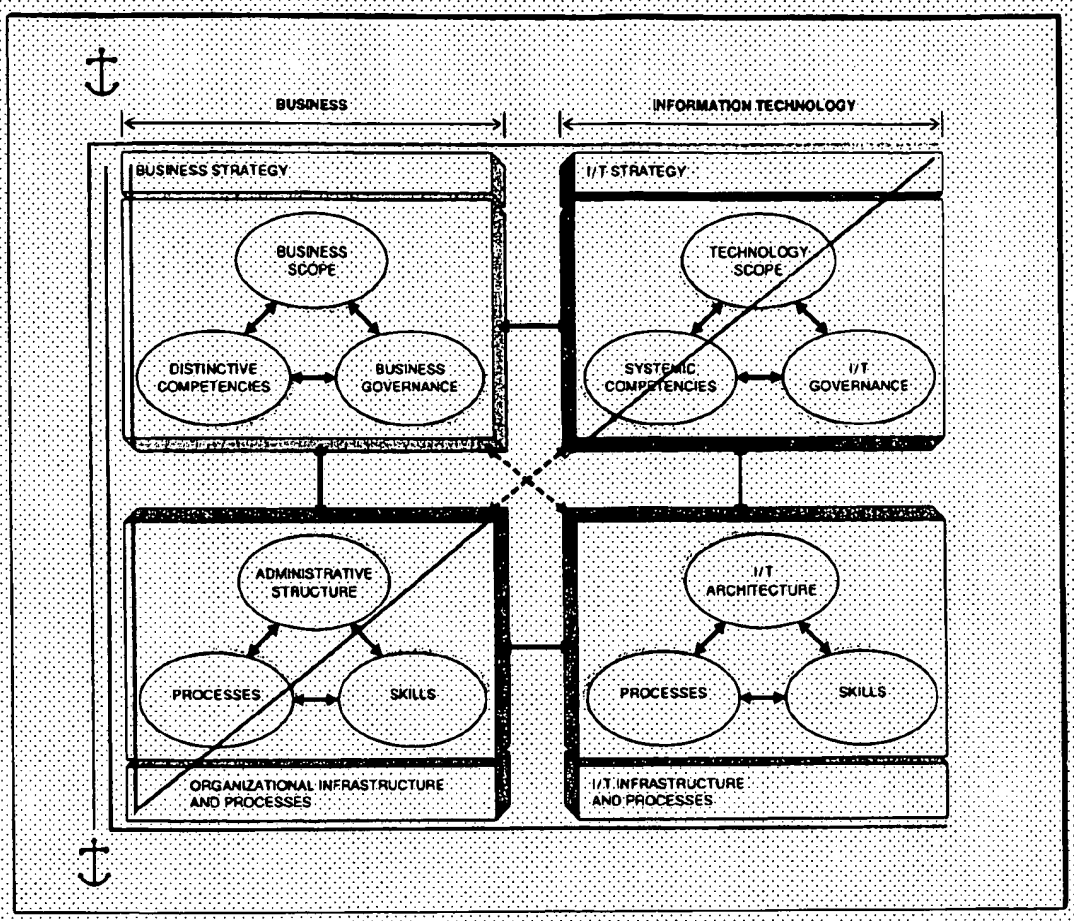
Figure 6 Technology potential and strategy execution perspective



how to build and sustain what has been called a world-class business within a business. This view focuses on the ability to deliver information technology products and services to the organization. To accomplish this task, executives must understand the relationship, pictured in Figure 4C, between I/T strategy (domain anchor), I/T infrastructure and processes (domain pivot), and organizational infrastructure and processes (impacted domain). The triangle is illustrated in Figure 5 as the I/T planning (ITP) triangle. Strategic management is now a process for deciding how to respond to the wants and needs of a customer. The role of the executive becomes that of a prioritizer. Since the service business is constantly balancing short-term responses to customer demand (for example, to provide a new application or report) with the long-term investment in infrastructure (for example, building a network architecture), a major challenge is to establish and sustain a direction or priority set. In this role, the management team uses these priorities to balance short- and long-term decisions effectively.

Some organizations describe the information technology function, or organization, as one of many

Figure 7 Business transformation–the strategic alignment framework



units that produce and disseminate information. The trend toward end-user computing exemplifies this position. In this environment, I/T takes on responsibilities such as formulating policies and controlling interorganizational transactions using vehicles such as service-level contracts (hence the name). The scope of technologies to be coordinated by the information technology organization has expanded significantly as processors, networks, personal computing, and office automation have merged. This approach centers on understanding the viability of the I/T organization to plan and reflect on changing structures and trends. Company decisions such as the one the Eastman Kodak Company made to outsource its data center operations are well-documented results of an enterprise I/T governance decision. The introduction of steering committees to define priorities is a second example of a governance decision.

I/T planning methods are effective for the service level perspective (see Figure 5). There is tight linkage to the creation of systems architectures and deriving and implementing technical plans for application development, end-user workstations, systems management, and network management. Business transformation methods are, of course, appropriate to re-engineer I/T.

Strategy execution. In the strategy execution perspective pictured in Figure 4D, the interrelationships between the three domains of business strategy (domain anchor), organizational infrastructure and processes (domain pivot), and I/T infrastructure and processes (impacted domain) are involved. Perhaps the most common perspective for the management of the information technology function is the view anchored on the notion that a business strategy exists and is the driver of both organizational design choices and the definition of I/T infrastructure. It addresses how strategic advantage can be obtained. This perspective is another "top down" approach. It recognizes the need for the framework to look down from the top of the organization, thus identifying critical areas for the success of the business. Projects are executed to support those areas. The approach typically is one way in which the results have information technology support organizational strategies but do not necessarily have information technology influence the business strategies. Not surprisingly, the role of executive leadership in articulating and communicating the business strategy is often cited as a critical success factor.

This approach is attractive because it recognizes that systems must be developed with strong linkage to the business strategy, and that the information technology strategy is based on future needs. Business transformation (illustrated in Figure 7) or I/T planning (illustrated in Figure 6), or both, are effective for strategy execution. The business transformation approach pictured in Figure 7 with business strategy (domain anchor), organizational infrastructure (domain pivot), and I/T strategy (impacted domain) is included to illustrate a third common flow. The method is selected based on the need to emphasize process.

The following are some of the analysis techniques that are typically applied when using business transformation methods. Porter's competitive forces are used to understand the business position of the enterprise within the subject industry. Gap analysis is used to determine how well the requirements processes address the major areas of concerns for customers. Henderson's market value outcomes model contributes to the assessment of processes within the business to determine which contribute to attainment of business goals and which are in conflict. If business transformation is appropriate, there is a tight linkage to I/T planning methods. Techniques such as traditional critical success factors[16] and business systems planning (BSP)[17] will be interwoven into the business transformation effort. I/T planning is illustrated in the I/T planning (ITP) triangle in Figure 5. The use of rapid prototyping has been applied to demonstrate proof of concept effectively. The prototype has often been extended to a full production environment. The creation of systems architectures and deriving and implementing technical plans for application development, end-user workstations, systems management, and network management typically follow.

Establishing the direction. The preceding discussion has identified the domain pivot, perspective, and method. We next describe how to establish the direction (clockwise or counterclockwise) for using the framework.

The strategic alignment framework suggests a continuous balancing act between internal and external factors, and between the business and information technology organizations. The position of the business vis-a-vis its products must be supported by appropriate processes or functions. The business processes or functions must be supported by effective efficient information technology. The essential issues are how information technology can be applied to the business plan to achieve superior returns.

To maximize the value, the initial domain pivot should contain issues external to the organization, where opportunities typically exist. Hence, the domain pivot should be either business strategy or I/T strategy. Typically (albeit not always), what is available from the technology platform and can be adopted as an I/T strategy is more constrained by the capability of the enterprise to exploit the technology than by the technology itself. Therefore, the first domain pivot typically is business strategy.

Given the selection of business strategy as the domain pivot, the choices for domain anchor using this competitive potential perspective are either I/T strategy (I/T strategy, Figure 5) or organizational infrastructure and processes (business transformation, Figure 7). The respective impacted domains would be organizational infrastructure and processes or I/T strategy. This suggests that the fourth element, I/T infrastructure and processes, remains stable for now. An I/T

planning effort, or different perspectives of I/T strategy or business transformation, will be included in a later phase.

Typically, information technology serves the organization. Changing the organization and its processes to satisfy strategy requirements may be more challenging than changing the I/T strategy. If this is the case, the initial flow should be counterclockwise, suggesting the creation of an I/T strategy (ITS), as illustrated in Figure 5. The effectiveness of the current business process should be confirmed before taking this path. If the business process is seen as requiring an assessment, do this first. If changing the I/T strategy is perceived as being more challenging than changing the organization and its processes, or if the business process is seen as requiring an assessment, the initial flow should be clockwise. "Improving" old processes by simply applying I/T ignores organizational infrastructure and processes, and performance deficiencies. This suggests business transformation as illustrated by Figure 7, using organizational infrastructure and processes as the domain anchor.

The preceding is consistent with the traditional flow that suggests having a business unit strategy based on business transformation. This would lead to an I/T strategy followed by I/T planning. The creation of systems architectures and deriving and implementing technical plans for application development, systems management, network management, and end-user workstations would ensue. However, today's demand to accelerate the adoption of technology may require firms to proceed without adhering to the described flow. If this is the case, they should understand the preceding considerations in planning the efforts of the firm. The framework ensures that each effort is appropriately focused and provides complete strategic choices for a firm.

Given that the initial cycle has taken place using the competitive potential perspective (or the company has the respective information available via other efforts), the next cycle should be considered from the perspective of service level, technology potential, or strategy execution.

If the initial decision was to go counterclockwise and create an I/T strategy, the next cycle would use business strategy as the domain anchor, organizational infrastructure and processes as the domain pivot, and I/T infrastructure and processes as the impacted domain. This strategy execution perspective, shown in Figure 6 and Figure 7, calls for either creating an I/T plan or identifying opportunities for business transformation, or doing both. The decision should be based on the impact to the organization and business processes, and the need to transform existing processes.

If the initial decision was to go clockwise (identify business transformation opportunities), the next cycle would use business strategy as the domain anchor, I/T strategy as the domain pivot, and I/T infrastructure and processes as the impacted domain. This technology potential perspective, illustrated in Figure 6, calls for deriving an I/T strategy.

Note that the only difference in the preceding descriptions of the second cycle is in the domain pivots. The intent is to constantly keep the business strategy, I/T strategy, and the resulting infrastructure and processes in balance. When equilibrium is disturbed—for example, a change in the business strategy—the remaining elements operate suboptimally until each has created the ability to support the change. The presence of early warning signs should trigger previously defined action scenarios that support, via structured processes, a new cycle or iteration. At times these changes or early warning signs may require the direction or anchor to be reconsidered.

As the methods are carried out, three important points to remember are:

1. The initial cycle is the most difficult because new information and techniques must be absorbed by the newly formed team.
2. One should continue to cycle (clockwise or counterclockwise) based on the initial flow. This cycling will ensure that each of the domains will be kept in balance. Use the enclosed figures to guide the scope.
3. The number of times to iterate through the four boxes is reconciled when the effort involved to complete a cycle may produce diminished returns relative to the anticipated improvement or refinement. As stated before, strategic alignment is not a single event. It is a continuous journey of transformation.

Ensuring alignment of I/T strategy with the enterprise. Historically, information technology has

been considered a support function. To obtain both strategic advantage and competitive advantage using information technology, I/T must be repositioned to where it can play a critical role in strategy formulation and implementation. The enterprise should recognize and exploit the capabilities of I/T to positively impact business scope, governance, organization, and competitive forces. The framework provides a vehicle to reposition the information technology organization by ensuring the alignment of I/T with the enterprise.

The methods applied for I/T strategy, I/T planning, and business transformation ensure the linkage of their domain to the business strategy. This is obtained by placing more attention on the central value driving the business processes. These processes reflect what the enterprise does to deliver and support its products or services. The application of information technology to these key processes can change the way in which the company does business, hence impacting the business and its strategies. This result may at first seem too obvious, especially when iterating between business strategy and I/T strategy or between business strategy and organizational infrastructure and processes. However, it is frequently not done. Opportunities are missed. Priorities are improperly set. It may not be so apparent when iterating diagonally between business strategy and I/T infrastructure and processes. Alignment is important here to ensure effective and efficient deployment of resources that are provided by the information technology organization. Also, alignment assessment should be formally conducted during value reviews or via performance measures or a combination of both.

Value assessments that take place during project justification, prioritization, and selection provide a meaningful vehicle for ensuring alignment. Strategic alignment helps to build a consensus across all of the participants assessing projects. The intent should be to get those making decisions to also make the assessments, or at a minimum concurring with them. Consensus works best when there is a shared vision. The decision makers should be able to establish the relative contribution of the information technology projects to the achievement of the previously defined business strategies. Criteria such as financial contribution, creating competitive advantage, improving market share, reducing risk, supporting business strategies, improving morale, and providing information required by the most important business processes or functions should all be considered. The intent is to rank projects based on their ability to ensure success in achieving business strategies. The development and use of a weighting factor relating the information technology projects versus the business strategies can be useful in establishing priorities.

Performance measures provide all management levels with feedback on how well the strategies are being accomplished. They must focus on critical processes or functions, enable proactive problem identification and correction, and promote continuous improvement. Viewing the business from the customer's perspective when establishing measurements is a key factor. Other important considerations are to access the impact on the ability of the organization to compete in the marketplace and to evaluate the progress in meeting the vision and mission. As strategies change over time, the measurements must keep pace. Formal feedback ensures that executive management's visions are translated into strategies for middle management (even if reduced), which in turn are translated into critical success factors, core competencies, and action plans for tactical management. The feedback should assess how effectively the business strategies are being carried out. The measurements should compare the results versus goals. The measurements provide feedback to critical success factors, processes or functions, and core competencies. External benchmarking is an effective vehicle to consider when defining objectives and measures.

Establishing harmony between I/T and business strategies should be included as a key part of management planning for the enterprise. Harmony will ensure that there is a focus on strategic achievement, not just organizational achievement. It should force the identification of specific business strategies and objectives, and the role information technology plays in achieving those strategies. This is strategic alignment.

Summary

This paper has introduced the environmental changes that are demanding the transformation of the enterprise. Examples of how the strategic application of information technology can transform

the business were provided. Given the preceding, the importance of aligning business strategies and I/T strategies was described. The paper related how the Strategic Alignment Model can be used as a framework for scoping and designing I/T strategy, I/T planning, and business transformation activities. Strategic alignment has proven to be an excellent vehicle for defining what methods are most appropriate and how the methods should be applied.

The reader should now have a good understanding of the importance of ensuring the alignment of business strategies, information technology strategies, and infrastructure and processes. The reader should also understand how the model can be used as a framework for scoping and designing I/T strategy, I/T planning, and business transformation activities. It is imperative to keep the intrinsic, dynamic nature of the methods in mind as they are adapted to fit the demands of the organization. The intensely competitive marketplace is demanding new I/T services. Without the organizational structure and set of internal processes that reflect the interdependence of the business and information technology, the enterprise will not be in a position to apply the innovative and enabling opportunities available from information technology. The significant decision is to make I/T an essential element of the business and the processes that support the business. It is up to you to take advantage of the knowledge and experience presented as the business embarks on the continuous journey of transformation.

Appendix: Description of strategic alignment terminology

Business strategy.

Business scope—Decisions that determine where the enterprise will compete. Often viewed as market segmentation, these choices define the types of products, niches, customers, and geography that determine the reach or range of the enterprise. They include the competitive forces (buyers, suppliers, substitutes, potential entrants) as described by Porter.[11]

Distinctive competencies—Areas that determine how the enterprise will compete in delivering its products and services. Why would a customer choose to buy or use the offerings from a particular company? These decisions determine those attributes of the strategy that create the capability of the enterprise to differentiate its products and services from competition. Examples of such choices include pricing strategy, the focus on quality, or the development of a superior marketing channel. Leveraging core competencies (competencies with substantial superiority over competition) plays a significant role in the derivation of strategies.

Business governance—Choices that focus on the issue of ownership: Will the enterprise enter a particular market as a single entity or via alliances, partnerships, or outsourcing? Governance choices today reflect a significant aspect of strategy whereby a business may attempt to garner traditional advantages of scale through alliances rather than ownership.

Organizational infrastructure and processes.

Administrative structure—The roles, responsibilities, and authority structure of the enterprise. Will the enterprise organize into product offerings or functional departments? How many layers of management will be required and to what extent will decisions be decentralized? These choices establish the structure within which the management and work processes will operate.

Processes—The manner in which key business functions will operate or flow. Essentially a value chain issue,[11] these choices determine the extent to which work flows will be restructured, perhaps integrated, to improve effectiveness and efficiency. Often the improvement of processes relies on changes to I/T. At other times the effective use of I/T requires major redesign of central business processes. Business transformation methods concentrate on adding value to strategic choices focusing on organizational infrastructure and process (especially regarding process), as illustrated in Figure 7.

Skills—Choices concerning the people who will carry out the strategy. What experience, competencies, commitments, values, and norms do the professionals require to meet the strategy? Will the business strategy call for new skills? Do implied changes conflict with traditional values and norms of the enterprise? The organizational infrastructure strategy must clearly define the human resource considerations for carrying out the work. Opportunities for outsourcing are also considered here.

I/T strategy.

Technology scope—Specific types of technology that are critical to the organization (e.g., knowledge-based systems, electronic imaging, robotics, multimedia, etc.). These decisions position the technology necessary to be successful.

Systemic competencies—Important characteristics and strengths of information technology that will be critical to the creation or extension of business strategies (e.g., information, connectivity, accessibility, reliability, response).

I/T governance—Extent of ownership of this technology (e.g., end-user executive, steering committee) or the possibility of technology alliances (e.g., partnership, outsourcing), or both. Application make-or-buy decisions are also included here.

I/T infrastructure and processes.

All are analogous to those made for the organizational infrastructure.

I/T architecture—Choices, priorities, and policies that enable the synthesis of applications, data, software, and hardware via a cohesive platform.

Processes—Design of major I/T work functions and practices such as application development, systems management controls, or operations.

Skills—Experience, competencies, commitments, values, and norms of the individuals working to deliver the I/T products and services.

Strategic fit. Strategic fit is the vertical relationship of the strategic alignment framework illustrated in Figure 3. Strategic fit emphasizes the need to make choices that position the enterprise in an external marketplace and decide how to best structure internal arrangements to execute this market-positioning strategy. The choices that position the enterprise in a market are called business strategy, and those choices that determine the internal structure of the enterprise are organizational infrastructure and processes. Performance of the enterprise is defined by the extent to which the choices containing these two strategies are consistent. As business strategies change, the organizational processes must keep pace. Similarly, the vertical choices between I/T strategy and its infrastructure and processes must be consistent. Using information technology to enhance these vertical choices provides the opportunity for strategic advantage.

Functional integration. The horizontal relationship of functional integration, shown in Figure 3, extends the strategic fit notion across functional domains. As business strategies change, I/T strategies and processes must also keep pace. It is in these situations where different functional relationships are defined. Unfortunately, the traditional view of information systems strategy is too often narrowly defined as decisions concerning only applications, data, and hardware architectures. This internal perspective does not address the need for management to understand how these architectural choices position the firm in a highly dynamic, evolving marketplace. Effective positioning of the firm in the technology market is critical to its ability to adapt and effectively leverage technology. Functional integration gives I/T the opportunity to provide competitive advantage.

Strategic perspectives. Each of the four perspectives (described in the main text) reflects an interplay among three key domains (boxes) forming what would appear as a triangle. Note that by creating perspectives that reflect cross-dimensional alignment (illustrated in Figures 5 and 6) one is, at a minimum, always considering a relationship that involves both strategic fit and functional integration. Each triangle consists of three components:

- Domain anchor—Area that provides (drives) the change forces applied to the domain
- Domain pivot—Problem area being addressed
- Impacted domain—Area being affected by a change to the domain pivot

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Cited references

1. D. McGregor, *The Human Side of Enterprise*, McGraw-Hill Book Co., New York (1960).
2. P. F. Drucker, *Managing for the Future, The 1990's and Beyond*, Penguin Books, New York (1992).
3. M. S. Morton, *The Corporation of the 1990's, Information Technology and Organizational Transformation*, Oxford University Press, Oxford (1991).
4. S. Davis and B. Davidson, *2020 Vision Transforms Your Business Today to Succeed in Tomorrow's Economy*, Simon & Schuster, New York (1991).
5. L. C. Thurow, *Head to Head: The Coming Economic*

Battle among Japan, Europe, and America, William Morrow and Company, New York (1992).
6. P. Keen, "Information Technology and the Management Difference: A Fusion Map," *IBM Systems Journal* 32, No. 1, 17–39 (1993, this issue).
7. J. C. Henderson and N. Venkatraman, "Strategic Alignment: Leveraging Information Technology for Transforming Organizations," *IBM Systems Journal* 32, No. 1, 4–16 (1993, this issue).
8. J. C. Henderson and N. Venkatraman, *Strategic Alignment: A Framework for Strategic Information Technology Management*, Center for Information Systems Research Working Paper No. 190, Massachusetts Institute of Technology, Cambridge, MA (August 1989).
9. *Baxter Healthcare Corporation: ASAP Express*, Harvard Business School, 9-186-005 (April 1986), 9-188-080 (February 1991).
10. M. D. Hopper, "Rattling SABRE—New Ways to Compete on Information," *Harvard Business Review*, No. 90307 (June 1990).
11. M. E. Porter, *Competitive Strategies, Techniques for Analyzing Industries and Competitors*, The Free Press, New York (1990).
12. J. I. Cash, Jr., F. W. McFarlan, and J. L. McKenney, *Corporate Systems Management: The Issues Facing Senior Executives*, third edition, Richard Irwin Inc., Boston (1992).
13. R. L. Nolan, "Managing the Crises in Data Processing," *Harvard Business Review*, No. 79206 (March 1979).
14. *Otisline Case Study A*, 9-186-304, *B*, 9-190-149, Harvard Business School (July 1990); *Otisline Revisited*, Darden School of Business, University of Virginia, Charlottesville, VA (June 1990).
15. *Frito Lay, Inc. Case Study A*, 9-187-012, *B*, 9-187-065, *C*, 9-187-123, *D*, 9-190-070, Harvard Business School (May 1991).
16. J. F. Rockart, "Chief Executives Define Their Own Data Needs," *Harvard Business Review*, No. 79209 (March 1979).
17. *Business Systems Planning Information Systems Planning Guide*, GE20-0527-4, IBM Corporation (July 1984); available through IBM branch offices.

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